Reflection of Crew Resource Management (CRM) Trainings to Real-Life Field Practice in Air Passenger Transportation: A Qualitative Research

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Article Info

Abstract

In the air transportation sector, flight safety stands as one of the foremost values. To ensure safety, airlines rely on Crew Resource Management (CRM) training. These training programs aim to foster coordination, communication, and awareness among all personnel involved in flight operations, encouraging rational responses to potential issues as a unified team. Naturally, as is the case with any training process, the practical applicability of CRM training alongside its theoretical structure is of paramount importance. Hence, this study, conducted within the framework of qualitative research, delves into the perspectives of cabin crew members regarding CRM training by evaluating its content, benefits, and real-life field applications. Employing interview-based methodology, qualitative data were gathered from 19 cabin crew participants through purposive sampling. The collected data underwent descriptive analysis, leading to certain conclusions. The findings illustrate that CRM training has a positive impact on emotional and knowledge management, communication skills, team collaboration, and a proactive approach in matters of safety. It underscores that CRM training significantly permeates into the realm of real-world applications—namely, flight operations. However, participants highlighted certain issues and emphasized the need for more practical, interactive, and participant-centered training methods for the enhancement of CRM training, aiming to address those concerns.

1. Introduction

With the rapid development of the civil aviation industry, the reliability of aircraft and equipment has become very high. Today, the cause of accidents and incidents during flights is no longer solely attributed to aircraft, technical hardware, or equipment issues. The attitudes and behaviours of flight crews have become one of the main factors leading to accidents, alongside their technical knowledge and skills.

Human factors, including errors made by crew members, have long been identified as a major cause of aviation accidents.

Past analyses have reported that 60% of fatal accidents occurring in scheduled passenger transport in the civil aviation sector are human-caused and more than 70% are directly caused by human error (İnan, 2018: 45). These data have been confirmed by official reports of aviation authorities. The International Civil Aviation Organization (ICAO) and the Federal Aviation Administration (FAA) consistently report that human error is a predominant cause of aviation incidents. The FAA's annual data indicate that human factors contribute to approximately 70-80% of aviation accidents (FAA, 2021). n its 2018-2022 accident analysis, the European Union Aviation Safety Agency (EASA) found that procedural violations and failure to adhere to safety protocols contributed

to over 60% of accidents caused by human error (EASA, 2022). Many flight accidents arise from human factors such as lack of situational awareness, negligence, miscommunication, and lack of coordination (Du & Zhu, 2022: 18). All of these elements pose significant risks to flight safety.

Flight safety encompasses all necessary efforts to identify, define, manage, and prevent hazards and risks arising from incorrect or faulty practices, leading to aircraft accidents or losses. These efforts involve a comprehensive approach that includes safety-related hardware, software, and human factors (Terzioğlu, 2018: 7).

It is necessary to acknowledge that the civil aviation industry is always associated with high risks, and flight and ground safety is critical in all its operations. Therefore, flight safety ranks among the most crucial factors for civil aviation organisations. These organisations place significant importance on Crew Resource Management (CRM) training to ensure the highest level of flight safety while maintaining the quality of the provided flight services without compromising their ability to respond to changing demands (Erdem, 2018: 1).

The concept of CRM was initially introduced by NASA (National Aeronautics and Space Administration) in 1979 to enhance flight safety by initially addressing communication principles among flight crews. Over time, this concept has

been further developed and has become a significant part of civil aviation training (İnan, 2018: 45). CRM has since been integrated into civilian and military aviation. It is designed to reduce aviation incidents caused by pilot errors by identifying observable behaviours that enhance team performance (Helmreich and Wilhelm, 1991). The initial inclusive goal of CRM was to manage social and cognitive skills during flight operations to ensure the safe functioning of the aircraft (Bruemmer, 2008; Kreischer et al., 2022: 2011). Today, CRM has been implemented into the civil aviation training curriculum for over forty years to optimise flight management, enhance safety, and improve flight crews' non-technical skills and performance (Jimenez et al., 2015: 946).

In its current sense, CRM is defined as the proper utilisation of available information, equipment, procedures, and human factors to carry out safe, efficient, and effective flight operations (İnan, 2019: 359). CRM focuses on the "human factors" considered non-technical skills in ensuring flight safety. It primarily involves managing hardware, software, and especially human resources through training to enable the safe and efficient execution of all flight operations (Jensen, 1997: 265). CRM recognises that besides technical knowledge and skills, the effective management of human factors is essential in achieving safe and effective flight operations.

CRM training is a team training strategy that focuses on improving team coordination, performance, and the expected attitudes and behaviours related to safety (Salas et al., 2006: 393-393). It is a series of instructional strategies designed to enhance teamwork (i.e., team knowledge, skills, and attitudes) by employing well-tested training tools and appropriate training methods (including theoretical lectures as well as simulators, videos, performance measurements, statistical data, role-playing, case studies, exercises, and simulations). The aim is to develop effective teamwork by applying these methods and tools in CRM training (Salas et al., 1999: 163).

CRM training is more field-specific, realistic, and applied than purely theoretical and generic (Hunt and Callaghan, 2008: 690). CRM training primarily encompasses two scopes: initial training and recurrent training. An initial CRM training is typically conducted in a classroom over 2 or 3 days (though this can vary from country to country and airline to airline). Following the completion of the initial course, recurrent training is conducted at regular intervals. Recurrent training typically consists of a half or full-day course focusing on a specific CRM topic and is also mandated by major civil aviation regulators (O'Connor et al., 2008: 356). The training is provided to all personnel related to flight operations, such as pilots, cabin crew, pursers, dispatchers, and air traffic controllers, in the form of basic training and recurrent training at specific intervals.

The training programs, with a particular emphasis on pilots and cabin crew, are designed within the framework of regulations set by the General Directorate of Civil Aviation (SHGM) at the national level, in line with the standards established by international authorities such as the International Civil Aviation Organization (ICAO) and the European Union Aviation Safety Agency (EASA) (IATA, 2016: 45). These training programs are conducted based on the Part-D documents, which are the training manuals of airline operators, by the standards identified by these authorities. Flying personnel who do not undergo annual CRM training or fail to refresh their CRM qualifications may have their flight licenses suspended (Bükeç & Başdemir, 2021: 1060).

CRM training provides essential guidance on effective communication, task sharing, workload management, teamwork, situational awareness, power distance, decision-making, leadership, and other related topics (Wagener & Ison, 2014: 4). The human skills imparted to personnel through CRM training aim to enable employees with different perspectives to work effectively as a team by efficiently utilising all available resources for a safe flight operation (Chute and Weiner, 1996; Karaarslan & Erkmen, 2021: 476). The training is theoretical, generic, field-specific, realistic, and applied (Hunt and Callaghan, 2008: 690). However, the knowledge and skills provided through CRM training can only be beneficial if they are effectively used in flight operations. Therefore, it is essential to assess CRM training programs' outcomes, effectiveness, content, and results and evaluate their alignment with real-world applications (Klampfer et al., 2011: 135; Baykın, 2021: 34-35). Assessing the aspects and various dimensions the training aims to instil, examining their reflections on actual field practices based on firsthand information, and reporting systems are crucial for gaining deeper insights.

It is possible to mention studies focusing on CRM training outcomes in the literature. One early study by Helmreich and Wilhelm (1991) examined the effects of CRM training on participants' self-reports and attitude measurements regarding cabin safety. The findings demonstrated that CRM training was positively received and led to significant and positive changes in attitudes and behaviours related to team coordination and personal skills. However, some participants reacted adversely to the training and observed negative attitude changes. The study highlighted that research on the reasons for this effect could reveal personality factors and group dynamics as critical determinants of responses to training and attitude changes.

Freeman (2005) demonstrated that participants perceived CRM training as beneficial and believed all aviation crew members should receive this training. Salas et al. (2006) showed that CRM training elicited positive participant responses and impacted learning and behaviour changes. The study conducted by O'Connor et al. (2012), which aimed to evaluate the effectiveness and outcomes of CRM training programs, revealed that maritime aviators found CRM helpful training, had an excellent overall understanding of the concepts covered in training, and displayed positive attitudes towards the concepts addressed. Bennett (2019) conducted a study to improve the pedagogy of CRM training. Based on survey results, it was suggested that the target audience of CRM training should be expanded to include operational personnel other than flight and cabin crew, and experiential/action learning exercises, such as spending time in a fully functional three-axis flight simulator, should be added. Bükeç & Başdemir (2021) aimed to propose a CRM training model to enhance its contribution to flight safety by identifying deficiencies that arise during training and obtaining solution suggestions and recommendations from CRM experts. Data were collected through surveys from pilots and cabin crew members, and semi-structured interviews were conducted with 6 CRM instructors to identify identifiable shortcomings during CRM training and determine the areas that need improvement. The results revealed that CRM training generally supports flight safety; however, there is a need for improvement in program content, teaching techniques, training tools, and instructor qualifications. Karaarslan & Erkmen (2021) examined the impact of Covid-

19 on the CRM attitudes of aviation sector employees and investigated whether there were any differences in CRM attitudes of cabin crews before and during the Covid-19 period. The research found no statistically significant difference in CRM attitudes. In one of the recent studies by Du and Zhu (2022), the authors aimed to discuss the common problems pilots face due to the lack of CRM training. The study proposed targeted programs to address issues such as pre-flight information acquisition, technical flight ability, crew communication, increasing situational awareness, and improving CRM skills. However, this study focused only on pilots and did not involve field application.

It is worth mentioning that there are studies focused on CRM training in civil aviation, aiming to provide insights into these training outcomes. However, it should be noted that these studies predominantly approach the topic through quantitative research. Furthermore, when evaluated from a holistic perspective, these studies have limited quantity, which enhances the importance of conducting further research in this area and increases the value of the findings and evaluations that will be obtained.

Under these circumstances, the main objective of this research is to examine the real-life implications of CRM training, which focuses on human factors in ensuring cabin safety in civil aviation passenger transportation operations, to guide cabin crew members' awareness, attitudes, and behaviours related to safety. Within this scope, the study aims to identify the practical application of CRM training in the cabin under the main topics of situational awareness, power distance, stress and workload management, intra-team communication and coordination, as well as to examine the consistency and inconsistency between the training content and its implementation in the field. The foundation of the research is based on making certain inferences and evaluations by obtaining responses from cabin crew members through a qualitative research method to contribute to the literature and field practice.

2. Materials and Methods

2.1. Research Design

This study is based on a qualitative research method. Qualitative research aims to explore the nature of phenomena, such as different manifestations of facts, their contexts, or perspectives in which they can be perceived. Qualitative designs are necessary to explore the reasons behind observed patterns, especially those that are unseen or surprising (Busetto et al., 2020: 1). "Qualitative" methods are often used to determine the participant's perspective to answer questions about experience, opinion, belief, meaning, and perspective. This is because data of this kind is generally not amenable to quantitative measurement. Qualitative research techniques typically involve interviews to investigate beliefs, attitudes, and concepts related to normative behaviour. "Semi-structured interviews" are used to obtain opinions on a focused topic or essential sources of information for background knowledge or institutional perspectives. In contrast, in-depth interviews are employed to understand a situation, experience, or event from a personal perspective (Hammarberg et al., 2016: 498).

2.2. Data Collection Method

The qualitative research method relies extensively on the data collection process. This study employed a semi-structured interview technique as a qualitative method. The semi-

structured interview technique has a predetermined structural form before data collection. However, the questions included in this form are primarily open-ended and depend on the research topic. These comprehensive questions allow the researcher to guide and encourage the participant towards the necessary points to obtain more data when their interest is high. This semi-structured format provides an opportunity for a detailed discussion within the boundaries of the research topic. It enables the researcher to freely guide the interview based on the content of the interviewee's responses (Oun & Bach, 2014: 254). In this context, voluntary interviewees participating in the research were guided through a previously prepared interview questionnaire, following a systematic structural approach, to sequentially address the questions and encourage them to provide evaluations as openly as possible.

The interview form for the research consists of two main sections. The first section includes descriptive questions such as gender, age, education level, position in the cabin crew, and professional experience. The second section contains the main questions. The formulation of these questions drew inspiration from studies conducted by Halbesleben et al. (2011), Kemper et al. (2014) and Van Den Berg et al. (2020). The questions were adapted, added, and organised under themes, undergoing supervision by expert academics to reach their final form.

These questions were sequentially directed to the participants to obtain data. During the interviews, the responses were recorded with the permission of the interviewees in the form of audio recordings. These audio recordings were analysed, transcribed into text format using computer software, and further investigated.

The themes addressed in the resulting structure of the research are as follows:

- Situational awareness (2 questions)
- Power distance (2 questions)
- Stress and workload management (2 questions)
- Team communication and coordination (2 questions)
- Implementation of CRM training in the field (4 questions)

In creating these themes, the responses from the participants were taken into account, along with the CRM literature and training content. The first four themes represent the main focus areas in literature and training, forming the thematic framework. The last theme aim to evaluate the reflection of training in the field.

2.3. Population and Sample

The study population consists of active cabin crew members in the civil aviation industry. In this research, purposive sampling, a non-probability sampling method, is planned to reach cabin crew members with characteristics that can represent this population. In qualitative studies, a relatively small and purposefully selected sample can be used to enhance the depth of understanding (as opposed to breadth) (Palinkas et al., 2015; Miles & Huberman, 1994).

Purposive sampling is a method used to select participants who are likely to provide relevant and helpful information (Kelly, 2010: 317) and is a way to identify and choose cases that effectively utilise limited research resources (Palinkas et al., 2015; Campbell et al., 2020: 2-3). Purposive sampling is the selection of sampling units within the population segment that possesses the most information about the variable of interest. It involves purposefully selecting from a specific

portion of the population, believed in providing the best examples to estimate the population parameter of interest (Guarte & Barrios, 2006: 278).

Determining the exact sample size for qualitative research can be challenging due to the nature of such studies, and it may not be appropriate to pre-determine it. One fundamental criterion for an ideal sample size is the formation of a saturation point, where the obtained information becomes saturated. After a certain point, new interviewees will provide data that is similar to or the same as the data provided by previous interviewees (Morgan & Morgan, 2008). During this saturation stage, the data collection process should be halted, and the sample size should be fixed where saturation begins (Onwuegbuzie & Collins, 2007; Baltacı, 2018: 262). Based on this information, in the data collection phase of the research, the aim is to gather data by enriching it with different perspectives within the purposive sampling framework. This is achieved by diversifying the participants among cabin crew members in terms of characteristics such as gender, age, and experience to represent different groups. As a result, the responses obtained from 19 participants constituted the research data set. As part of the research, informed consent was obtained from the cabin crew members who were reached by providing them with information about the purpose and subject of the study. Within this framework, data could be obtained from willing participants following the structure of the interview questionnaire.

2.4. Data Analysis Method

The responses obtained from the participants were taken as they were without any intervention from the researcher. However, to ethical considerations in qualitative research, pseudonyms were used instead of participants' real names. The data obtained from the interviews, converted into text format, were subjected to descriptive analysis.

Descriptive analysis is a qualitative research method used to analyse the content and context of the variables under study. This method aims to obtain systematic data using inductive techniques, where information is sought within the social reality. This approach's fundamental data analysis includes description, classification, and correlation. The findings obtained from the data are summarised and compared. The researcher examines the developed themes concerning each other, explores relationships and differences, and tries to conclude by making various connections (Özdemir, 2010: 330). In this context, the data obtained from the participants in the research were examined based on descriptive analysis, and certain inferences and evaluations were made in line with the identified themes.

3. Result and Discussion

In the first section of the questions addressed to the participants of the study, gender, age, education level, role in cabin crew, and professional experience (years) are included. In light of the obtained data, the sample characteristics reflecting the participants' attributes are presented in Table 1.

Table 1. Distribution of Characteristics of the Participants

Parti-cipant	Gender	Age	Educat-ion Level	Role	Expe-rience (years)
P1	Female	36	Bachelor's	Instructor	13
P2	Male	38	Master's	Supervisor	16
P3	Male	48	Master's	Instructor	26
P4	Female	38	Bachelor's	Supervisor	17
P5	Female	45	Master's	Supervisor	25
P6	Female	45	Bachelor's	Supervisor	23
P7	Female	43	Bachelor's	Instructor	16
P8	Female	44	Bachelor's	Purser	21
P9	Female	38	Bachelor's	Instructor	13
P10	Female	36	Bachelor's	Instructor	7
P11	Female	36	Bachelor's	Instructor	18
P12	Female	40	Bachelor's	Instructor	18
P13	Female	43	Master's	Instructor	22
P14	Male	49	Bachelor's	Supervisor	27
P15	Male	44	Bachelor's	Supervisor	26
P16	Male	40	Master's	Supervisor	19
P17	Female	40	Master's	Instructor	10
P18	Female	50	Master's	Instructor	30
P19	Female	49	Bachelor's	Supervisor	26

The findings obtained under five themes, derived from the participants' responses and the evaluations made within this framework, are presented below.

Situational Awareness

SA1. Do you believe that you possess the personal knowledge and skills required for safety-related requirements?

Many of the participants expressed that, following the completed CRM (Crew Resource Management) trainings, they believe they possess the knowledge and skills necessary to meet the requirements for flight safety. The participants' responses acknowledge the importance of knowledge and skills for safety-related requirements.

"Mostly yes. But if there is a change related to the requirements, I try to take action quickly." (P3)

"In addition to the trainings, I believe I have this knowledge and skills because I carefully follow safety-related announcements and bulletins." (P4)

"Yes, the required standard procedures already make it mandatory." (P9)

"I think I am at a sufficient level, but I am open to improvement within the framework of daily conditions." (P12)

"Yes, receiving competency-based training from the organization I work for has an impact on acquiring these knowledge and skills." (P13)

"Through the training I have received and my flight experience, I believe I possess this knowledge and skills." (P15)

"Thanks to the training I have received and my experiences, I believe I can meet the relevant requirements." (P19)

SA2. When an unusual situation arises that goes beyond routine non-standard SOPs or written rules and materials related to cabin safety, what actions should be taken to manage this situation?

The responses received highlighted the significance of CRM safety knowledge in managing unusual situations related to cabin safety. Participants emphasized the importance of

being prepared for potential scenarios and the value of adhering to acquired information and Standard Operating Procedures (SOPs).

"At that moment, having accurate information is important to make the right decision. This way, more precise actions can be taken." (P2)

"I try to compile cumulative knowledge and seek verification beyond acquired information." (P3)

"I believe in always having situational awareness. The 'what if' game gains importance here. Mental preparedness is a must." (P4)

"It's necessary to engage in mental simulations about possible scenarios and play the 'what if' game to be ready." (P5)

"Based on the known information, an assessment of the situation should be made." (P6)

"Taking into consideration all aspects of the situation within the framework of existing knowledge and rules, the most suitable solution should be generated." (P7)

"Decisions should be made by leveraging existing SOPs. Any perceived gaps should be reported." (P10)

"Situations should be managed without deviating from SOPs." (P11)

"I act in accordance with the available documents and CRM knowledge and skills." (P15)

"The person who possesses comprehensive safety-related knowledge can call upon the most appropriate information, assess the situation, and make the best possible decision." (P17)

Power Distance

PD1. During the flight, assume you encounter a situation related to cabin safety that you perceive as unusual and serious. Suppose you are the first one to notice it. How would you communicate about this situation with your supervisor at that moment?

In response to the question aimed at assessing how participants would handle cabin safety-related issues during a flight and how they would communicate, the respondents demonstrated their appreciation for essential elements such as clarity, speed, collaboration, effective body language, honesty, and seriousness in communication. Alongside communication skills, a focus on situational analysis and solution-oriented approaches also becomes evident in these responses. Almost all participants are aware of the need to report the situation as quickly, accurately, and objectively as possible.

"I convey all information quickly with a clear statement; it should be open and straightforward." (P1)

"I would inform the cabin manager and other team members that I need assistance related to the matter." (P2)

"Firstly, I make an effort to communicate and report the relevant violation or issue." (P3)

"I immediately convey the situation to the cabin manager without adding any personal interpretation. If they are not nearby, I use the interphone to inform them and save time." (P4)

"If I'm close to the interphone, I use it, or if I'm close to another cabin crew member, I communicate with them and take action accordingly." (P5)

"I convey the situation to the team using clear and concise words along with appropriate body language and tone of voice." (P9)

"It's necessary to report the situation as it is and, if there is a mistake, admit it honestly." (P12)

"As quickly as possible, I need to objectively communicate the severity of the incident to my manager." (P16)

PD2. You notice that your supervisor does not take a danger risking safety seriously based on their personal experience. However, in your opinion, this situation could worsen and compromise safety. What would you do in this situation?

Participants indicated that they demonstrated determined persistence in convincing their supervisors when faced with situations where their supervisors did not take safety-threatening issues seriously. The overall inference from these responses is that participants emphasize the importance of assertiveness, effective communication, and persistently conveying safety concerns to their superiors. Many candidates seem to be focused on finding ways to address the situation without undermining the authority of their supervisors. Participants frequently mention the importance of emphasizing the significance of the situation and displaying unwavering perseverance. Their focus on highlighting the severity of safety hazards and their willingness to explore different communication strategies reflect a solid commitment to safety protocols and a proactive problem-solving attitude.

"I insist on carrying out the required task. I exhibit assertive behavior." (P1)

"I would share the situation with them. If the attitude persists, I would report through the appropriate reporting system." (P3)

"I emphasize the importance of the situation by displaying determined persistence." (P5)

"I ensure that the captain is informed. I make every effort possible concerning the situation." (P7)

"I utilize my skill of determined persistence." (P9)

"I would explain to them assertively why this situation could violate safety regulations." (P11)

"I mention the potential consequences." (P12)

"I describe the situation in an explanatory manner. If they insist, I try to convey it using different approaches. If I am confident in my knowledge, I would persist." (P16)

Stress and Workload Management

SWM1. Do you review physical fatigue or stress issues before or during the flight? How do you manage this situation?

This question revolves around how candidates manage and address physical fatigue and stress issues before and during flights. The responses collectively underscore a strong awareness of the importance of managing personal well-being to ensure safety and performance. The candidates' answers consistently highlight self-awareness and preparedness. Many participants exhibit a proactive approach by taking pre-flight measures such as adequate rest, healthy eating, and proper sleep. Several candidates mention understanding their personal limits and taking precautions accordingly. This demonstrates a high level of responsibility and understanding regarding the potential impact of physical fatigue and stress on performance. Participants are conscious of the potential risks associated with fatigue and stress and prioritize managing these factors to uphold both their well-being and their responsibilities as part of the flight crew.

"I try to become aware of my own limits." (P1)

"I pay attention to my rest before the flight. I focus on healthy eating and sleep." (P2)

"I know my body's limits. I take precautions knowing that sleep deprivation can greatly affect me and lower my performance." (P4)

"I apply the checklist for this issue before every flight." (P5)

"I observe my own condition at every stage." (P7)

"I live in accordance with adequate rest hours." (P9)

"I make sure to get enough rest before flights." (P13)

"I rest myself physically and mentally." (P15)

SWM2. In your opinion, what kind of risks can stress and workload pose while performing your duties? Are there safety-related tasks in your work environment that could be affected by your fatigue, negative mood, or stressful situations?

In response to this question that focuses on the potential risks of stress and workload in the work environment concerning the fulfillment of tasks and safety-related responsibilities, the answers provided insights into participants' understanding of the negative impact of stress, fatigue, and negative mood on ensuring safety and performing effectively. The responses indicate a clear awareness of the risks associated with stress, workload, and negative mood. Participants acknowledge that these factors can lead to errors, reduced situational awareness, lack of attention, hinder the use of standard skills and competencies, and ultimately jeopardize safety. Many participants have emphasized the potential for making mistakes and errors under stress and high workload conditions.

"It can make us prone to errors. We can lose situational awareness." (P1)

"Stress and workload can push us towards making mistakes. That's why managing them is important." (P2)

"Increased stress and workload can make it harder to use regular abilities and competencies. They can lead to safety violations." (P3)

"The stages of the flight can be negatively affected by this. It can create an unsafe environment." (P7)

"It reduces situational awareness, leads to violations." (P8)

"It can prevent us from noticing the mistakes made. It can lead to complacency and a decrease in situational awareness." (P12)

"It can prevent us from recognizing threats, leading to incomplete controls." (P13)

"It can lead to incomplete or incorrect procedures and information sharing." (P17)

"It makes us prone to errors, disrupts concentration." (P19)

Team Communication and Coordination

TCC1. How does a negative situation within the team, such as a communication issue (e.g., a minor dispute with a team member or supervisor), affect you during the flight?

In response to this question that examines how participants react to adverse events, especially communication issues within the crew, during a flight, the answers reveal that participants generally fall into two different perspectives. Some participants reflect professionalism, safety, and a commitment to effective communication. The answers highlight the importance of sustaining professionalism and self-regulation. Candidates emphasize that they should not allow personal emotions to influence their behavior and decisions during a flight. There is a tendency to focus on constructive and vocational approaches to finding solutions. Participants intended to remain focused on their tasks and not allow negative events to impact their performance adversely.

"I think about and investigate the root cause. I consider that the problem might be from both the other side and from me, and decide accordingly. I exhibit appropriate behavior so that it doesn't negatively affect safety." (P2)

"I try not to take it to a point where I lose control. I experience this situation positively and constructively." (P3)

"Emotions have no place in professionalism. Objective decisions cannot be made if emotions are involved." (P4)

"I try to remain unaffected and concentrate on my duties with a professional attitude." (P7)

"I don't allow it to affect me with a professional attitude." (P11)

"I don't perceive the issue personally and prevent the situation from escalating." (P12)

On the other hand, some participants acknowledge that situations of this kind can have a range of emotional and psychological effects on themselves. While the responses use different phrasings, there is a consistent acceptance of the negative impact of adverse events.

"It can lead to a decrease in my motivation." (P1)

"I may be negatively affected, but I make an effort not to reflect it onto other team members." (P13)

"It has a negative effect, increases stress, and physical fatigue." (P14)

"It has a negative impact." (P15)

"It affects negatively, but I resolve it within the framework of rules without personalizing it." (P18)

"It has a negative effect." (P19)

TCC2. When a safety-related situation arises in your unit, who takes on the leadership role in decision-making? Are responsibilities shared collectively as a team, or is there a hierarchy in place?

In response to this question investigating how participants approach decision-making when a safety-related situation arises in their units, the answers overwhelmingly indicate an acceptance of a hierarchical structure for decision-making. The responses consistently demonstrate that there is a hierarchical structure in place for making decisions related to safety situations. Participants state that reporting and decision-making responsibilities are clearly defined within their units.

"The relevant department supervisor takes responsibility, hierarchy is in place." (P9)

"The hierarchy includes the captain, chief, manager; each officer has a separate role. Reporting is the responsibility of the supervisor." (P10)

"A higher-level supervisor takes on the responsibility, and there is a hierarchical order in decision-making." (P11)

On the other hand, there is an explicit acknowledgment of the existence of a hierarchy. However, in addition to this, a specific subset of responses has revealed a combination of teamwork and shared responsibility. The answers consistently emphasize the importance of teamwork and shared responsibility in making decisions related to safety and security. Some participants highlight that safety is a collective effort involving the entire team, and all team members share a common goal of ensuring safety.

"There is only one right thing when it comes to safety. We need to make the right decision as a team without forgetting that we are a team." (P2)

"Matters related to safety are the responsibility of every employee. The responsibility for decision-making lies with upper management, and the responsibility for reporting lies

with subordinates. However, any employee can intervene in a safety-related matter if necessary." (P5)

"The process is carried out through sharing as a team." (P14)

"It's shared collectively." (P15)

"Although there are levels, solving a problem is everyone's responsibility." (P18)

Implementation of CRM Training in the Field

IMP1. What are the most significant aspects that have stuck in your mind from the CRM training you received? Regarding flight operations, what benefits does CRM training bring to cabin safety?

In response to this question, focusing on the essential takeaways from CRM training and the benefits of CRM training for cabin safety in flight operations, a significant portion of the answers emphasize the importance of CRM training in improving communication, teamwork, safety awareness, and effective resource management. The responses indicate that CRM training is crucial in increasing safety awareness and promoting a sense of teamwork between cabin and cockpit crews.

"CRM is essential for a safe flight." (P4)

"As cabin and cockpit crews, we embrace the concept of empathy and teamwork more with these training sessions." (P5)

"CRM is crucial for managing communication skills related to safety." (P6)

"It enables harmonious teamwork within the team. By acting together and sharing responsibilities, it contributes to achieving safety goals most easily." (P7)

"Our attitudes in situations affect safety. The knowledge and skills to manage all resources are directly related to how safety is ensured." (P9)

"Sometimes, especially in situations where SOPs are not enough, the awareness created by CRM is indispensable." (P12)

"The most effective aspect of CRM training is its ability to provide the skills to understand the other party and manage communication appropriately." (P16)

In addition to these responses, many participants mentioned using interactive methods during CRM training, such as real-world scenario-based applications, games, discussions, case studies, and accident videos. This shows that various engaging training techniques contribute to effective learning and retention.

"The Swiss Cheese Model is memorable. CRM training has an impact on increasing knowledge, skills, and forming specific attitudes." (P2)

"What is most memorable are past accidents and incidents. This awareness helps us stay safer." (P10)

"Examinations of past aircraft accidents are most memorable. The mistakes made in these accidents help us learn lessons." (P13)

"The applications, games, and discussions we had in CRM training stick in mind. They change our perspectives on events and help us look at them more safely." (P14)

"Interactive games and case analyses provide significant benefits." (P15)

"The support of incident case studies, accident videos, and group work emphasizes the importance of communication and teamwork." (P19)

IMP2. How is the CRM approach implemented in your unit? Could you provide an example of how you use CRM training concepts during your work?

In response to this question focusing on how CRM concepts are applied in participants' units and how they are practically implemented in daily operations, a significant portion of the answers reflect a range of ways in which CRM principles are integrated into various stages of flight operations. The responses indicate that CRM principles are integrated into unit team dynamics and are used to ensure flight safety. Participants emphasize applying CRM concepts from pre-flight checks to in-flight activities throughout flight operations. This illustrates that CRM principles are not limited to specific stages but are seamlessly integrated into the entire operational process.

"In our unit, assertive behaviors are applied. Especially proactive thinking and behavior models are implemented." (P5)

"It enables harmonious teamwork within the team. We move together and apply CRM principles through task sharing." (P7)

"The knowledge gained in CRM training is practically applied during flight operations." (P9)

"Leadership, decision-making, and taking initiatives are concepts that are attempted to be consolidated on a common ground." (P11)

"CRM principles are effectively used throughout all stages of flight operations, especially during pre-flight checks and in-flight, even extending to the ground crew." (P16)

"Especially, CRM methods are included in checklist items during flights." (P17)

"They are used to ensure flight safety during flights." (P18)

IMP3. Have you observed any obstacles, shortcomings, or gaps while applying the information provided in training (i.e., during flight operations)?

In response to this question investigating whether obstacles, deficiencies, or gaps are observed while applying CRM training information in flight operations, specific prominent themes emerge from the answers. Some participants focus on issues related to document usage and procedures. Some responses emphasize concerns about the practicality of using documents during flight operations. Participants suggest that document usage might be perceived as time-consuming and that they might not always refer to documents due to impracticality.

"Document usage is seen as a time-consuming activity, and sometimes, due to impracticality, we don't refer to documents." (P13)

"There are deficiencies in tracking documents." (P14)

"The problem lies in the impracticality of document usage." (P15)

Some responses highlight challenges related to time pressure, workload management, and attention to detail. The common theme in these responses is the negative impact of time pressure and excessive workload on implementing CRM training concepts. Participants stress that these factors can hinder the proper execution of safety procedures and practices.

"For instance, security checks conducted in the cabin are sometimes not done properly due to time pressure, unlike what is taught in classes." (P4)

"Areas like time and attention management, excessive workload, can lead to gaps." (P9)

"Time pressure is an obstacle. There can be very little time between schedules, and it can be challenging to catch up." (P18)

"Time pressure and excessive workload can create certain gaps." (P19)

In addition to these responses, some answers highlight challenges related to timely action, knowledge management, individual dynamics, psychological factors, empathy, and self-assessment. These responses demonstrate that the difficulties in implementing CRM training are multidimensional and beyond simple procedural matters.

"Delayed action, correct information arriving late, clinging to old information, mixing old and new information can be mentioned." (P3)

"Depending on the flight dynamics, there can be obstacles in prioritizing or implementing information. Especially, individuals staying in the blind spot, an area where skills are not applied, is one of the gaps we encounter." (P5)

"Obstacles arise due to individuals' varying psychological capacities." (P11)

"Different perspectives, inability to empathize, prejudice, lack of self-assessment." (P12)

IMP4. What changes would you suggest for CRM training? In your opinion, how could it be conducted to be more effective?

The responses to the question investigating recommendations for improving and making CRM training more effective overwhelmingly emphasize a recurring theme: the importance of practical application. Participants suggest that CRM training would be more effective if it included practical scenarios, case studies, and live examples from daily flight operations.

"Increasing practical applications and enabling individuals to self-realize through their participation could be important." (P1)

"I believe that employees at every level should conduct case studies." (P2)

"Being more hands-on and having a longer duration would be more effective." (P3)

"I think it would be more appropriate to share a larger number of case studies." (P4)

"There should be an increase in hands-on training." (P6)

"I think concrete examples from actual flight operations are much more effective than textbook definitions. Providing real-life examples of all concepts in daily life and flight operations can be more effective for the targeted groups of participants." (P7)

"Practical scenarios will be more effective." (P9)

"Applications, group work, and aligning them with the purpose they serve can be important." (P10)

"Being more interactive and focused on case studies could be beneficial." (P13)

"More case study analyses can make the training more effective." (P15)

"Hands-on training should be increased, and more case studies should be included." (P17)

"Group work should be done, supported by scenarios, and the practical emphasis should be on which information serves which purpose." (P18)

"The number of lessons should be increased. It should be supported with more hands-on, scenario-based training." (P19)

As evident from these responses, many participants emphasized the desire for CRM training to be more practical, interactive, and application-oriented.

4. Conclusion

Aviation industry's CRM training offers fundamental guidance in effective communication, task sharing, workload management, teamwork, situational awareness, power distance, decision-making, leadership, and related areas (Wagener & Ison, 2014: 4). The human skills imparted through CRM training aim to enable personnel with diverse perspectives to efficiently collaborate as a team, utilizing all available resources for safe flight operations (Chute and Weiner, 1996; Karaarslan & Erkmen, 2021: 476). However, the knowledge and skills from CRM training can be beneficial only when effectively applied in flight operations. This study explores the real-life effects of CRM training, which focuses on human factors in ensuring cabin safety within civil aviation passenger transportation operations. It examines cabin crew members' awareness, attitudes, and behaviors related to safety. Employing a qualitative research method, data were obtained from 19 cabin crew participants through interviews, and findings were evaluated under five themes.

Under the "Situational Awareness" theme, responses indicated that many participants believe they possess the necessary personal knowledge and skills for safety requirements following CRM training. Addressing how to manage unusual situations beyond routine standard procedures, participants emphasized the importance of CRM safety knowledge. The need for accurate, up-to-date information, situational awareness, and mental preparedness was noted. Furthermore, the importance of adhering to Standard Operating Procedures (SOPs) and utilizing existing knowledge and rules was evident in their responses. These results illustrate that CRM training plays a significant role in enhancing situational awareness and decision-making abilities in the context of flight safety.

Responses under the "Power Distance" theme clearly show participants' value for practical communication skills, transparency, and urgency regarding safety matters. Participants highlighted the significance of open and concise communication and objective reporting of situations. They expressed determination to convey the seriousness of situations and emphasize potential outcomes. Their focus on collaborating with team members and conveying the seriousness of situations without personal interpretation underscores their commitment to ensuring safety. Their willingness to employ various communication strategies and explore different approaches while respecting authorities signifies a proactive problem-solving attitude.

Key insights emerged regarding the "Stress and Workload Management" theme. Overall, responses demonstrate participants' priority for personal awareness, proactive well-being measures, and understanding the impact of stress and workload on performance and safety. While addressing the risks of stress and workload, participants comprehended the potential adverse effects of these factors. Emphasis on adequate rest, healthy nutrition, sleep, and self-awareness suggests a proactive approach to managing stress and workload to ensure health and flight safety. Participants reflected a safety-conscious and responsible attitude, committing to managing these factors to achieve optimal task performance and safety.

Responses within the "Team Communication and Coordination" theme reveal that some participants possess high professionalism, safety commitment, and effective emotional management. They highlight the importance of maintaining professionalism, preventing personal emotions from influencing behavior, focusing on constructive solutions, and prioritizing safety and effective performance by demonstrating a solid commitment to their roles and responsibilities. Conversely, another group of participants acknowledged potential negative impacts from adverse situations. This highlight specific difficulties in CRM implementation. While responses vary, consistent acceptance of the adverse effects of negative events is notable. This points to a lack of awareness in maintaining cabin safety, emphasizing the need for improvement. Examining the decision-making process regarding safety situations in their units, responses reveal an explicit acceptance of hierarchical decision-making structures. However, a subset of responses within this theme emphasizes the significance of teamwork and shared responsibility even within a hierarchical framework. Participants acknowledge that safety is a collective effort despite hierarchy, and all team members are responsible for ensuring safety.

Findings under the "Implementation of CRM Training in the Field" theme reveal a belief in CRM training's positive impact on enhancing empathy, communication skills, teamwork, safety awareness, and resource management. CRM principles are considered a predominant element throughout the pre-flight and flight stages. Many participants emphasized the effectiveness of interactive training methods like real-world scenarios, discussions, case studies, and accident videos in facilitating impactful learning. On the other hand, the use of documents during flights has been perceived as time-consuming and impractical, and attention has been drawn to the potential for time pressure and excessive workload, leading to gaps in safety procedures.

As a general evaluation, these findings demonstrate that participants perceive CRM training to positively impact emotion and knowledge management, communication skills, teamwork, and a proactive approach to safety matters. CRM training significantly permeates into the real-world application field, namely flight operations. It can be said that all individuals within the flight crew feel a high level of responsibility for safety within this scope, which is attributed to CRM training.

In line with these research findings, the relevant literature supports the positive impact of CRM (Crew Resource Management) training on various aspects of aviation safety. For instance, Helmreich et al. (1999) revealed that CRM training fosters a safety-focused mindset among crew members and ensures a higher level of shared responsibility for safety. The study highlights that crew members who have received CRM training are more likely to identify potential safety threats and take proactive measures to mitigate them. These findings are consistent with our findings, suggesting that CRM training leads to a heightened sense of responsibility for safety among flight crew members. A comprehensive review of CRM training in aviation conducted by Salas et al. (2001) found that CRM training significantly improves flight crews' communication, teamwork, and decision-making skills. The study concluded that practical CRM training reduces human error, is critical in aviation operations, and enhances safety outcomes. Similarly, a study by O'Connor et al. (2008) examined the effects of CRM training on airline crew members and found that CRM training significantly improved communication and teamwork among flight crews. The study reported a noticeable increase in standardized communication procedures following CRM training, emphasizing collaborative decision-making, which is crucial for safe flight operations. The authors concluded that these improvements in communication and teamwork directly contribute to enhanced safety and efficiency in flight operations. Flin and O'Connor (2017) emphasized that CRM training makes crew members feel better equipped to handle stressful situations and communicate effectively, contributing to a safer flight environment. Another related study by Kanki et al. (2010) addressed the broader impacts of CRM training on crew members' abilities to manage their emotions and information under stress, noting that CRM training provides flight crews with tools to manage stress and emotions more effectively, thereby helping to maintain cognitive function and decision-making quality in high-pressure situations. According to a study by Mulyanto et al. (2021), CRM training enhances communication and coordination among flight crews, leading to improved teamwork and operational efficiency. Meta-analyses and evaluation studies have shown that CRM training is generally well-received by participants and leads to positive changes in attitudes, knowledge, and behaviors related to teamwork and safety. All these findings align with the results obtained in this specific research. However, the limitations in the literature concerning concrete data on the practical application of CRM training in daily life, particularly in the actual cabin environment, are inspiring for future research.

These results indicate that training effectiveness can be enhanced by incorporating more practical, interactive, and participant-centered approaches. Therefore, linking what participants learn during CRM training with real-life scenarios can contribute to more lasting knowledge retention and practical skill application. Organizing feedback sessions with team members at specific intervals can provide an opportunity to identify areas for improvement and encourage intra-team communication, coordination, and continuous learning. In this regard, both airlines need to consider feedback from flight crews and future research to determine how employees within the flight crew approach the subject, as seen in this study, regarding ensuring safety.

Besides all, this research has revealed the benefits of CRM training and its correspondences in real-world field practices. All findings and evaluations based on these findings are grounded in qualitative research and are limited to the research sample. In future research, considering different samples may provide further insights. On the other hand, qualitative research allows participants to express their opinions freely. It enables in-depth evaluations, yet it is essential to emphasize that due to its subjective nature based on personal experiences and views of participants, it may not be entirely objective. Therefore, using quantitative methods in this field can also contribute to the literature and field by providing a more balanced perspective.

Ethical approval

The necessary permission for the ethical aspect of the research was obtained through document no. E-88083623-020-125736 With the decision numbered 2023/07 dated 03.08.2023 of İstanbul Aydın University Social and Human Sciences Ethics Committee, stating that the research is deemed ethically appropriate.

Conflicts of Interest

The authors declare that there is no conflict of interest regarding the publication of this paper.

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